ROYAL BOTANIC GARDENS, KEW.

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XXV.—CORDIA MYXA AND ALLIED SPECIES.

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An enquiry addressed to Kew respecting the distribution of *Cordia Myxa*, L., has rendered necessary a critical examination of the herbarium specimens referred to that species. According to various authorities *Cordia Myxa*, L., enjoys a wide distribution, ranging from the Zambesi delta in Africa, through Egypt and Palestine to Cochin-China and Tropical Australia. We find that this is not the case, and that *Cordia Myxa* is in all probability confined to Asia Minor and Egypt, where it is mostly found in cultivation.

In order to define the true *C. Myxa*, we must begin with Linnaeus's description of the plant in the Species Plantarum (1753). Under *Cordia Myxa* (vol. i. p. 190), there are quoted a number of synonyms, the earliest of which is the "Sebesten sylvestris & domestica" of Alpini,* De Plantis Aegypti (1592). Alpini describes and figures two plants, "Sebesten domestica," with ovate, rounded, entire leaves, and "Sebesten sylvestris" with ovate-oblong, crenulate leaves. He gives an account of the local methods of preparing birdlime from the fruits of both kinds, and also their uses in medicine for various affections of the throat and chest. These species are no doubt *Cordia Myxa*, L., and *Cordia crenata*, Del., respectively.

The next authority quoted by Linnaeus is Bauhin, Pinax, p. 446 (1623). Bauhin also, like Alpini, distinguishes the same two species, and in addition he gives a number of references to more ancient literature which need not concern us in the present paper. Following this Linnaeus mentions Rheede's Hortus Malabaricus, vol. ix. p. 77 (1689), wherein is described an Indian plant under the name of *Vidi-maram*. Rheede says that it occurs at various places in Malabar, especially in marshy situations around Bardella. Rheede's plant is a distinct species, *C. obliqua*, Willd., widely spread in India and Malaya, and occurring also in Mauritius, but probably there introduced. Linnaeus also quotes

* Linnaeus does not quote the earliest edition of Alpini (1592), but evidently refers to the edition of 1640, p. 30.

(5505.) Wt. 196—794. 1,125. 11/18. J. T. & S., Ltd. G. 14. Sch. 12.

Commelyn, Horti Medici, p. 139, fig. 72. This seems to be a picture rather of the Indian plant than of *C. Myxa* proper.

In the Hortus Cliffortianus, p. 63, Linnaeus, under the name "Cordia foliis subovatis serrato dentatis" united the plants recognised as distinct by Alpini and Rheede, remarking "Auctores specie distinguunt domesticum seu cultam arborem a sylvestri quod mihi paradoxon est." By failing to distinguish the three species, however, the "paradox" seems to have been of Linnaeus's own making. His Materia Medica, p. 57 (1749), the latest quoted work, fortunately does not add to the confusion. It seems clear, therefore, that Linnaeus in the Species Plantarum confused no less than three species, (1) *Cordia Myxa* (emend.), the "Sebesten domestica" of Alpini and "Myxa" of the Ancients, (2) *Cordia crenata*, Del., the "Sebesten sylvestris" of Alpini, and (3) *Cordia obliqua*, Willd., the "Vidi-maram" of Rheede's Hortus Malabaricus. The specimen in Linnaeus's herbarium at the Linnean Society is the real *C. Myxa*. It is marked as having been grown in the Upsala garden.

Of the post-Linnean authors, the best account of *Cordia Myxa* is given by Delile, Flore d'Egypt, 47, t. 19 (1812). Delile gives beautiful and accurate figures of *C. Myxa* and *C. crenata*, and states that both species are cultivated in the gardens of Cairo.

I have tried without success to segregate the specimens referred to *C. Myxa*, L., and *C. obliqua*, Willd., by C. B. Clarke in the Flora of British India (vol. iv. pp. 136-7), and have come to the conclusion* that only one rather variable species is represented. The young and mature leaves of many of the specimens from the same localities have frequently a very different appearance, but the difference appears to be if anything merely seasonal. According to a note by Wight the plant "is a very common shrub or small tree. . . . It is, I think, a male or a hermaphrodite at different seasons of the year—at some seasons, say, from March till about May when covered with flowers, it is difficult to find a perfect one, all being males; but a few months afterwards it flowers again and every flower is perfect but much fewer in number than before." According to Post, Fl. Syria, &c., p. 532 (1896), the cymes of *C. Myxa* are also polygamous.

The specimens referred to *C. Myxa* in the Flora of Tropical Africa (iv. pt. ii. 14) are *C. Goetzei*, Gürke. It differs from *C. Myxa* in its membranous, obovate, cuneate, glabrous leaves, slender pedicels and style arms, and probably much smaller fruits. We have seen no true *C. Myxa* from Tropical Africa except from the French Sudan, where it is cultivated around the native villages (*Chevalier*).†

As stated above, the mucilaginous pulp of the fruits of *Cordia Myxa* has been used as a birdlime from very early times; it is now supposed to be used in the manufacture of unpuncturable motor tyres.‡ The localities in the Orient where it is known to

* Cooke (Fl. Bomb. ii. 199) came to the same conclusion and referred all he Indian specimens to *C. Myxa*, L.

† Bull. Soc. Nat. d'Accl. Fr. 1912, 135.

‡ *fide* Holland, Useful Plants of Nigeria, Kew Bull. Add. Ser. ix. pt. iii. 471.

grow are set out in detail below. In most of these regions the fruits are probably ripe about the end of June.

Key to Cordia Myxa and its related species.

Style arms short and broad, expanded fanwise towards the apex and with lobulate margins (see fig. 1, A); leaves always more or less orbicular, entire or obscurely repand in the upper part, always lightly covered all over the lower surface with white short setulose hairs, flabellately 5-7-nerved from the base; anther-filaments nearly glabrous at the base	*C. Myxa*, L. (emend.)
Style arms long and slender and only sometimes slightly expanded at the apex (see fig. 2); leaves variable but usually penni-nerved at the base, if hairy, then the hairs fairly long and mainly in the axils of the nerves and near the mid-rib; anther-filaments rather densely setose-pilose towards the base	*C. obliqua*, Willd.
Style arms long and slender, not expanded at the apex; leaves elliptic, crenate in the upper part, glabrous or nearly so, penni-nerved at the base; anther-filaments pilose towards the base ...	*C. crenata*, Del.

Cordia Myxa, *Linn.* Sp. Pl. i. 190 (1753), emend.; Amoen. Acad. iv. 452 (Fl. Palest.) (1756); Hasselq. It. 458 (1757); Delile, Fl. Aegypt. 47, t. 19 (1812), partim; Boiss. Fl. Orient. iv. 124 (1879); Post, Fl. Syria, Palest. et Sinai, 532 (1896); Chevalier in Ann. Inst. Col. Marseille, 1902, t. 3; et in Bull. Soc. Nat. d'Accl. Fr. 1912, 135; Muschler, Manual Fl. Egypt, 780 (1912); Holmboe, Veg. Cyprus, 146 (1914). *Prunus Sebestena*, Matth. Comm. ed. Valgris, 267 (1565). *Sebestena domestica* Alpini, De Plant. Aegypt. 12, t. viii. fig. 1 (1592); ed. 1640, 30, cum icon.; Pluk. Alm. t. 217, fig. 2 (1696). *Sebestena domestica* Bauh. Pin. 446 (1623). *Cordia sebestena*, foliis sub-rotundis, Forsk. Fl. Aegypt. lxiii. (1775). *Sebestena officinalis*, Gaertn. Fruct. i. 364, t. 76, fig. 1 (1788). *Cordia officinalis*, Lam. Ill. 420, no. 1895, t. 96, fig. 3 (this figure is reproduced from Gaertner).

Cyprus. Hagia Napa, "cultivated and subspontaneous for several centuries," *Holmboe* (l.c.)

Asia Minor. Mt. Taurus, *Kotschy*, 566; Suedieh, Gulf of Eskenderum, fruiting specimen without collector's name, in *Herb. Hook.* Palestine; hot plains around Jericho, June 9, 1911, in fruit, *Meyers & Dinsmore*, 5132.

EGYPT. Gardens of Cairo, Alexandria and Rosette, *Jomard* (Herb. Gay); *Sieber*; large tree in the Royal Vineyard at Scut, *Schweinfurth*, 1480, 1480B.

1. *Cordia Myxa*, L.; A. Style-arms; (shoot and fruits natural size; floral parts enlarged). 2. Style-arms of *Cordia obliqua*, Willd. (enlarged).

Arabia. Muscat, cultivated, *Aucher* 4965.

Tropical Africa. French Sudan; Moussaia (cultivated), *Chevalier*, 463; naturalised in villages of French and Nigerian Sudan, *Chevalier* (l.c.)

Boissier (l.c.) says that the tree occurs around Basra and in the island of Karrak in South Persia; it is known in Babylon as *Bombar*, and the fruit in Egypt as *Mokhayet*. Bornmueller* also observed the tree in Karrak in 1894.

According to Post (l.c.), the tree flowers from January to May, and is cultivated everywhere; he records it as being "spontaneous in Ghor (Palestine); the fruit is edible and is principally used for making birdlime; bark a tonic; wood used to kindle fire by friction; formerly used by Egyptians to make sarcophagi."

Muschler (l.c.) states that it is "cultivated in old gardens, often naturalised; abundant near Luksor and in the Great Oasis."

Cordia Myxa, var. *domestica*, C. B. Clarke (Fl. Brit. Ind. iv. 137) is no doubt a very distinct species and was described as such (*C. domestica*) by Roth. The very long beak of the berries, small few-flowered lateral inflorescences, small shortly petiolate repand leaves coated below when young with a mealy indumentum are its striking features.

Cordia obliqua, *Willd.* Phytogr. 4, t. iv. (1794); Sp. Pl. i. 1072 (1797); DC. Prodr. ix. 479 (1845); C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 137, excl. var. (1883); Watt, Dict. Econ. Prod. Ind. ii. 565. *C. indica*, Lam. Dict. vii. 49 (1806); DC. l.c. 500. *C. latifolia*, Roxb. Fl. Ind. ed. Car. & Wall. ii. 330 (1824); Dalz. et Gibs. Bomb. Fl. 173. *C. Myxa*, Roxb. l.c. 332; Wall. Cat. 889; Wight, Ill. t. 169; Dalz. et Gibs. l.c.; Benth. Fl. Austral. iv. 386; Bedd. For. Man. 165, et Fl. Sylv. t. 245, fig. A.; Brand. For. Fl. 336; Kurz, For. Fl. ii. 208; Thwaites, Enum. 214; C. B. Clarke l.c. excl. var.; Watt, l.c. 563; Gamble, Man. Ind. Timb. 500-501; Merrill, Interp. Rumph. Herb. Amboin. 447 (1917); non Linn. *Vidi-maram*, Rheede, Hort. Malab. iv. t. 37. For further references to literature and detailed information as to native names and uses, see Watt, ll.cc.

Widely spread over nearly the whole of the warmer parts of India and Ceylon (often cultivated), Malacca, Indo-China, Hainan, Formosa, Java, Philippines (*C. Blancoi*, Vidal), New Guinea and Tropical Australia.

Vernacular name of the fruit in India, *Lasora;* known to Anglo-Indians as *Sebesten*.

C. obliqua, var. *Wallichii*. C. B. Clarke (Fl. Brit. Ind. l.c. 137) is a distinct species (*C. Wallichii*, Don) and has been regarded as such by Talbot (Trees Bomb. ed. 2, p. 243) and Cooke (Fl. Bomb. ii. 200). It may be distinguished from *C. obliqua* by the rather densely tomentose buds and undersurface of the leaves.

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* Mitt. Thüring. Bot. Ver. Neue Folge, Heft. vi. 57 (1894).

Cordia crenata, Delile, Fl. Egypt, 51, t. 20, fig. 1 (1813); DC. Prodr. ix. 479; Boiss. Fl. Orient. iv 124; Aschers. et Schweinf. Ill. Fl. Egypt, 108, no. 713; Muschler, Man. Fl. Egypt. 781. *Sebesten sylvestris*, Alpini, De Plant. Aegypt. 12, t. viii. fig. 2 (1592); ed. 1640, 31, cum icon. *Cordia Myxa* foliis serratis, etc., Forsk. Fl. Aegypt. p. lxiii. no. 136.

3. *Cordia crenata*, Del. Natural size, pistil enlarged (partly after Delile).

Egypt. Cultivated in gardens, and in places naturalised; local name *Mokhayet rumy* (c.f. Muschler, l.c.).

The Abyssinian specimens referred to this species in the Flora of Tropical Africa (vol. iv. pt. ii. p. 16) appear to be distinct. The young shoots and leaves are scabrid-puberulous and the flowers are apparently much larger. It should be known under the name *C. Bakeri*, Britten in Journ. Bot. xxxiii. 88 (1895).

XXVI.—THE FLORA OF MADRAS: II.

The issue of the first part (pp. 1-200) of the *Flora of Madras* was recorded in *Kew Bulletin*, 1916, at p. 57. We have now to announce the appearance of a second instalment (part 2, *Celastraceae* to *Leguminosae-Papilionatae*, pp. 201-390) which has been prepared by Mr. J. S. Gamble. It was arranged, when the commencement of the Flora was undertaken, that as explanatory notes were not admissible in the text, it would be well for any explanations to be given in separate notes. The first instalment of these notes was prepared by Mr. S. T. Dunn, who drafted the opening Families of the Flora and the notes have now been con-

tinued by Mr. Gamble. We are indebted to Mr. Gamble's courtesy for the opportunity of placing these on record for the information of workers in herbaria, relative to conclusions with regard to particular species dealt with in the work that differ from those arrived at by earlier writers.

Notes on the Flora of Madras.*

J. S. Gamble.

Menispermaceae.—Since the publication of Part I of the *Flora* specimens of the following two additional species have been received from Mr. A. W. Lushington from the Madgol Hills of Vizagapatam District, from about 3000 to 4000 ft. elevation.

Pericampylus incanus, Miers; F.B.I. i. 102.

Hypserpa cuspidata, Miers. *Limacia cuspidata*, Hook. f. & Th.; F.B.I. i. 100.

Hypericaceæ.—To the geographical distribution of *Hypericum mysorense* should be added "E. Ghâts, Madgol Hills of Vizagapatam at 4500 ft."

Rutaceae.—*Limonia crenulata*, Roxb., is the name which, as explained by Trimen in Journ. Linn. Soc. xxiv. 142, must be adopted for the plants recorded in the Flora of British India under the name *L. acidissima*, Linn., the actual specimens in Hermann's Herbarium, which are in leaf only, showing that they belong to *Feronia Elephantum*.

Ochnaceae.—An examination of the specimens in Wight's Herbarium shows that *Ochna Wightiana*, Wight, and *O. Heyneana*, Wight, are quite distinct. The former is a plant with small obtuse leaves, while the latter has oblong-lanceolate leaves. It is well figured in Wight, Ic. t. 288, but the description applies chiefly to *O. Wightiana*.

Meliaceae.—I have endeavoured, after careful examination of the good supply of excellent specimens in the Madras and Travancore Herbaria, to set right the difficulty I have always felt about the species of *Aglaia*. If Wight and Arnott's figure (Ic. t. 166) of their *Milnea Roxburghiana* be compared with Beddome's t. 130, which represents two branchlets, one from what he calls the common form, the other from a tree of the Tinnevelly hills, it must be at once recognised that they cannot refer to the same species. The plant figured by Wight is, of course, the true *A. Roxburghiana*, and some of the material available agrees well with it. Among Beddome's specimens in the Madras collection are some that have every appearance of being the exact ones from which his figure was taken, and these show that his 'B' variety, of which Bourdillon collected several good specimens in all stages, is a distinct species which I have therefore described as *A. Bourdillonii*. The 'A' variety of Beddome might also be easily considered distinct, but I have thought it best to describe it as var. *Beddomei* of *A. Roxburghiana*, W. & A. It is the most common form of the tree in the South Indian forests.

* Previous notes, by Mr. S. T. Dunn, appeared in *Kew Bulletin*, 1916, p. 58.

CELASTRACEAE.

KURRIMIA. Lawson, in the Flora of British India identified Beddome's *Trochisandra indica*, Fl. Sylv. t. 120, of which he had seen no specimens, with *Kurrimia paniculata*, Wall., and described a new species, *K. bipartita*, from specimens collected by Wight in the Sivagiri hills of Tinnevelly. Beddome's specimens in the Madras Herbarium agree with Wight's and are, I consider, distinct from *K. paniculata*. As Beddome's name is older than Lawson's, *K. bipartita*, Laws. must now give place to *K. indica*, Gamble, n. comb.

ELAEODENDRON. My own observations in the field and my collections, and my examination of Wight's and other specimens in the Madras Herbarium, convince me that Wight and Arnott were right in keeping separate *E. glaucum* and *E. paniculatum*. I am inclined to think that investigations in the field will show that there may be a third species characterized by small leaves drying green and very short cymes, but the material is at present insufficient.

RHAMNACEAE.

VENTILAGO. I have spent some time over this genus and the excellent series of specimens available confirm in my mind the opinion I always held in the field that *V. calyculata*, Tul., is quite distinct and easily separable from *V. maderaspatana*, Gaertn. I have also described as new what I consider two species distinct from both: *V. Goughii* allied to *V. calyculata*, and *V. lanceolata* allied to *V. maderaspatana*.

SAGERETIA. After carefully examining the specimens at Kew and those in the collections placed at my disposal, I have come to the conclusion that *Sageretia parviflora*, G. Don, is distinct from the North Indian *S. oppositifolia*, Wall. Mr. T. A. Sprague, of Kew, very kindly went over the specimens with me and the difference appeared to us to be as follows:—*S. oppositifolia*, Wall. Leaves thick, long-acuminate; main-nerves up to 12 pairs, rather close (·3 to ·4 in. apart), strongly impressed on the upper surface where, too, the reticulation is inconspicuous. Thyrses contracted, united in a leafy subcylindric panicle with the rhachises and calyx-tube crispately white-villous; disk very narrow; flowers ·15 in. in diam. *S. parviflora*, G. Don. Leaves thinner, short-acuminate; main-nerves only about 5-6 pairs, more distant (·4 to ·6 in. apart), not impressed or with the lower ones impressed on the upper surface where the reticulation is easily apparent. Thyrses loose, either united into a pyramidal, almost leafless, panicle or terminating leafy lateral shoots, the rhachises merely puberulous, the calyx-tube glabrous; disk broader; flowers ·1 in. in diam. The oldest name for the South Indian plant seems to be *Rhamnus parviflora*, Klein; Roem. & Sch. Syst. v. 295 (1819); two years later (1821) it was described from Dr. Heyne's specimens in Roth, Nov. Pl. Sp. 153.

GOUANIA. I have included in the Madras Flora *G. leptostachya*, DC., though I have seen no specimens in Herbaria. I feel sure I have seen it growing in the N. Circars and the locality is given by Roxburgh and W. & A.

VITACEAE.

I have followed Planchon and Gagnepain in the arrangement of the genera, most of which were in the Flora of British India included under *Vitis*. I have followed Gagnepain in considering *Cayratia* as a genus and had finished my draft of the genus before I received vol. xi. part 3 of the Philippine Journal of Science, in which Dr. Merrill has pointed out that Loureiro's name *Columella* takes precedence (1790) of *Cayratia*. Though describing his species under *Columella*, Dr. Merrill gives reasons for thinking that *Cayratia* should be retained, and I have thought it best to adhere to that name and leave my descriptions as written under *Cayratia*.

TETRASTIGMA. There seem to be no available authentic specimens of *Vitis lanceolaria*, Roxb., but Roxburgh's drawing of the male plant copied in Wight, Ic. t. 177, gives its characters sufficiently well to convince me that Wight and Arnott were right in separating *V. muricata*, well figured in Wight, Ic. t. 740. I cannot agree with Planchon in placing *V. sulcata*, Laws., which has very well-marked leaves and large fruit, under *Tetrastigma lanceolarium*.

AMPELOCISSUS. I have admitted to the Flora *A. divaricata*, Planch., on the strength of a specimen collected in the hills of Vizagapatam by Mr. A. W. Lushington. Unfortunately, it has leaves only, and the leaves are not easily distinguished from those of *A. tomentosa*. So many North Indian species extend to the hills of the Northern Circars that I think the occurrence of *A. divaricata* very likely and so I have admitted it.

CAYRATIA. *C. mollissima*, Gagnep. (*Vitis mollissima*, Wall.) is interesting as being a Malay species, also found in Malabar and the Nilgiris on the western slopes of the Ghâts. The Madras specimens differ only in the broader seeds, more crispate hairy branches and more deeply serrated leaflets. *C. auriculata* (*Cissus auriculata*, Roxb.) has been placed in *Cissus*, sect. *Cayratia*, by Planchon and has all the appearance of *Cayratia*. But the seeds differ, chiefly by the presence of vertical lobes in the albumen as in *Cissus*. It seems best to retain it in *Cayratia*, however, for the present at any rate, for the seeds do not resemble those of any other of our species of *Cissus*.

LEEA. The Madras specimens of *Leea robusta* agree with those of Wall. Cat. 6826, collected in the Botanic Garden, Calcutta. But they do not agree so well with those figured in Roxburgh's plate No. 2043 which, however, only shows the uppermost and youngest leaves which have smaller and more lanceolate leaflets than ours have. *Leea aequata*, Linn., has been admitted to the Madras Flora on the strength of a specimen collected by myself in the Northern Circars, which agrees well enough with the Bengal and Burma specimens, except that there are many fewer of the flat round glands on the under-surface of the leaves.

STAPHYLEACEAE.—TURPINIA. *T. nepalensis*, Wall., as found in South India, seems to be identical, as Wight and Arnott considered, with the Himalayan tree, and in both localities it is a mountain species, very easily recognised in the forests. But I

am convinced that *T. pomifera*, DC. (*Dalrymplea pomifera*, Roxb. Cor. Pl. iii. t. 279) is only a tree of North Indian low levels and that the one found in the Western Ghâts and on the West Coast is distinct from it. I have therefore described it as *T. malabarica* (*Kew Bull.* 1916, 135).

Anacardiaceae.

Buchanania. I have followed Dr. Cooke in adopting the name *Buchanania Lanzan*, Spr., for the well-known *B. latifolia*. The identity of *B. intermedia*, Wight, Ic. t. 81, seems to be in some doubt. In the Flora of British India it is considered as a western variety of the eastern *B. lucida*, Blume, and Engler, in placing *B. lucida* as a variety of *B. florida*, Schauer, has made of *B. intermedia* another variety of the same. In the Madras Herbarium are many specimens from the Deccan Hills, including the Nagari Hills from whence Wight's plant came, which have thin leaves agreeing well in shape with those of Wight's figure. The flowers are, however, those of *B. angustifolia*, which sometimes has rather thicker leaves, and I think I am right in following Beddome and quoting *B. intermedia* under *B. angustifolia*.

Spondias. I have failed to find, among the specimens in the various Herbaria I have consulted, any that I think I can identify with Roxburgh's *S. acuminata*. Engler considered it entirely doubtful as a species, and I have thought it best to omit it from the Madras Flora. Trees which flower at the season when they are leafless are often very imperfectly represented in Herbaria and only those living on the spot near trees which they believe to be the right ones can collect specimens in all stages of flower, leaf and fruit, and settle such questions as this.

Nothopegia. This genus was founded by Blume in 1850 on the plant described by Wight in 1840 in Ill. i. 185 and Ic. t. 236 as *Pegia? Colebrookiana*. The specimen on which Wight's description and figure were based was collected by Wight in the "Shevagherry Hills" in Tinnevelly, in August, 1836, and is Kew Distribution No. 557. It has coriaceous, oblong or obovate, entire leaves with parallel main-nerves (about 15 pairs) and a short blunt acumen. They are 3-4 in. long and 1-1½ in. broad, with a stout petiole ¼ in. long. The inflorescence, which is in the fruiting stage, consists of axillary or lateral racemes about ¾ in. long, and the fruit is described as globose with an acute top ending in the persistent style and capitate stigma, in diameter ⅓ in. The pericarp is thick, full of oil-cells, and the seed has thick fleshy cotyledons with a basal radicle. Blume considered that the plant did not belong to the genus *Pegia*, founded by Colebrooke on the plant known as *Tapiria hirsuta*, Hook. f., transferred by Engler to *Phlebochiton extensum*, Wall. In the Flora of British India, Wight's Shevagherry specimens are described as *Nothopegia Colebrookiana*, Blume, var. *macrocarpa*, Hook. f., and the variety is accepted by Engler in DC. Monogr. iv. 468, who quotes, which Hooker did not, Wight, Ic. t. 236. But all the same, there cannot be any doubt that Wight's specimen, so far from being a variety of others, is the type of the species. It is a pity that both the genus

and the species should have been described before the flowers, either the male or the bisexual or both, were known. Among the material which I have available for the work on the Flora of Madras, besides Wight, K.D. 557, the only specimens which I believe belong to it are (1) some of Col. Beddome's, without locality, with male flowers in close racemes about 1 in. long, leaves up to 5 in. long with a longer acumination and rather more main-nerves and petioles $\frac{1}{2}$ in. long; and (2) a specimen collected by Lady Bourne on the Coonoor Ghát, Nilgiris, with ♂ flowers and leaves quite like Wight's. These I propose to call *Nothopegia Colebrookiana*, Bl.

In 1849, Dalzell described, in the Journal of the Asiatic Society of Bombay, iii. 69, a genus *Glycycarpus* and a species *G. racemosus*, the specific name having been given on the supposition that the plant was identical with *Holigarna racemosa*, Roxb., which is *Drimycarpus racemosus*, Hook. f., a pentamerous species from Bengal. The species was again described in Hook. Journ. Bot. ii. 39 (1850) and Hook. Ic. t. 842; also in Dalz. & Gibs. Bombay Flora, 51 (1861) and from the specimens in the Madras Herbarium and the description, the plant has oblong leaves 6-8 in. long, $1\frac{1}{2}$ to 3 in. broad, with an abrupt acumination, $\frac{3}{4}$ in. petiole and about 20 pairs of main-nerves. The flowers are in more slender open panicles up to 3 in. long and the drupe is transversely oblong, depressed at the apex and with a quite thin pericarp. In my opinion, Dalzell's plant, of which there is a considerable amount of material from the Bombay and Madras forests of the Western Ghâts, is distinct from *N. Colebrookiana*, under which it has been placed by Hooker and Engler, and I propose to change its name to *N. Dalzellii*, the specific name *racemosa* being apparently inadmissible.

In his Flora Sylvatica of South India and Ceylon, Beddome gives Blume's description of *Nothopegia* (amplified to describe the flowers, etc.) and a Plate, No. 164, drawn by Dr. Thwaites from a Ceylon specimen. Beddome's description and plate are also quoted by Hooker and Engler under *N. Colebrookiana*. An examination of the plate, of Beddomé's South Indian specimens and of Thwaites' C.P. 1260, shows that the plant figured has oblong, long—but not always abruptly—acuminate thin leaves, 3 to 5 in. long by 1 to $1\frac{1}{2}$ in. broad, very slender flower panicles and a transversely oblong vertically more or less striate drupe with thin pericarp. It is quite unlike Wight's plant and is distinct, in my opinion, from it. It differs less, perhaps, from *N. Dalzellii*, but the thin narrow leaves, nearly glabrous inflorescence, and striate fruit separate it, and I propose to call it *N. Beddomei*.

In the Flora of British India, a second variety of *N. Colebrookiana* was formed by Sir Joseph Hooker, based on Wall. Cat. 8500 and called var. *Heyneana*. It is a plant with small narrow obtuse leaves and blue drupe, and the Madras Herbarium contains a large number of specimens which are identifiable with Wall. Cat. 8500, their leaves varying in length from $1\frac{1}{2}$ to 5 in. and in breadth from $\frac{1}{2}$ to 2 in., their inflorescence very short and the fruit (immature only) ovoid apiculate. This can be, I think, quite safely regarded as a species, *N. Heyneana*.

There are two other species about which there is no question, *N. travancorica*, Bedd., and *N. aureo-fulva*, Bedd., the latter remarkable for having leaves subopposite, and the branchlets and petioles densely rusty-villous.

I think the arrangement arrived at, of 6 species, is the best I can propose, but I should not be at all surprised if *N. Dalzellii* were, after further investigation in the field, to be split up into two, a northern one with large prominently nerved leaves, the plant described by Dalzell, and a southern one chiefly represented in the Kew and Madras Herbaria by specimens collected by Lady Bourne, in which the leaves are smaller and much less prominently nerved and the inflorescence shorter. I have for the present called it var. *angustifolia*.

CONNARACEAE.

ROUREA. I have not followed O. Kuntze and Schellenberg in separating the non-American species of *Rourea* as a separate genus *Santalodes* or *Santaloides*. The material available of *Rourea santaloides*, W. & A., seems to be roughly divisible into two groups, connected, however, by intermediates. One group has rather small, thick leaves, drying black; the other has larger and thinner leaves drying olive-brown. I have failed to find any good differentiating character in the flowers and fruits and must therefore follow previous workers and consider that there is only one rather variable species. The Flora of British India says the sepals are 'not ciliate' but in every case I have found them ciliate.

CONNARUS. I believe I am right in identifying Beddome's Vizagapatam specimen with *C. paniculatus*, Roxb.

XXVII.—TEFF RUST.

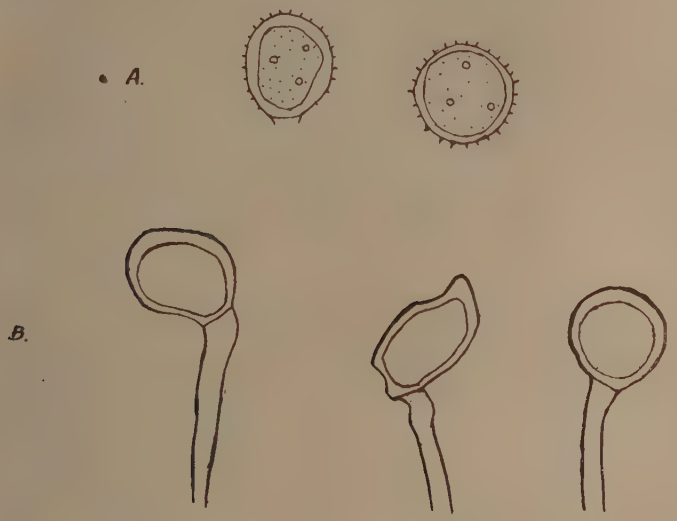
I. B. POLE EVANS.

Teff (*Eragrostis abyssinica*, Link) in South Africa is very subject to rust, especially the crops which are grown late in the season. Rust has been observed on this crop for the past eight years, and is equally prevalent and destructive on both the High veld and Low veld. Heavy dews in particular hasten its appearance, and are most favourable to its development.

The rust belongs to the genus *Uromyces*, and appears to be an undescribed species. A somewhat similar rust, *Uromyces Eragrostidis*, Tracy, has been described on two species of *Eragrostis*, viz.: *Eragrostis pectinacea* from North America and *E. cynosuroides* from India. *E. curvula*, Nees, in South Africa is also commonly attacked by a rust, a species of *Uromyces* which differs slightly from the description of *U. Eragrostidis*, Tracy, chiefly in the length and colour of the teleutospore pedicel. The *Uromyces* on *Eragrostis curvula* is identical with that on Teff (*E. abyssinica*, Link), and it seems therefore not improbable that the rust which attacks Teff so severely in South Africa has passed over to it from the indigenous grass *E. curvula*.

The description of this rust is as follows:—

Uromyces pedicellata, *Pole Evans. Sori uredosporiferi* amphigeni, praecipue epiphylli, sparsi, oblongi, minuti, $\frac{1}{2}$-1 mm. longi vel confluendo striiformes majoresque, epidermide diutius tecti, flavo-brunnei; *uredosporae* globosae vel subglobosae, subtiliter echinulatae, flavae, 23-27 μ diametro, poris germinationis



A. Uredospores. B. Teleutospores. × 600.

5-7 instructae. *Sori teleutosporiferi* amphigeni vel culmicolae, minuti, oblongi vel lineares, epidermide diu tecti, atri; *teleutosporae* variabiles, globosae, subglobosae, piriformes, vel ellipsoideae, saepe angulatae, apice rotundatae vel truncatae, non vel lenissime incrassatae, leves, castaneo-brunneae, 15-22 × 21-30 μ: pedicellus hyalinus, apice leviter brunneolus, persistens, usque 45 μ longus.

South Africa. Transvaal: Pretoria, on leaves and stems of *Eragrostis abyssinica*, Link, and *E. curvula*, Nees, *Pole Evans*, 8945 (1915), 11318 and 11319 (1918).

XXVIII.—NEW AND RARE BRITISH FUNGI.

E. M. Wakefield.

During the past two years a number of miscellaneous fungi new to the British Flora have been noted in the course of official work.

The fungus *Cercosporella Antirrhini*, apparently an undescribed species, has been twice reported as doing some damage to cultivated Antirrhinums. *Nectria fusco-purpurea* occurred on plum trees of the variety Pond's Seedling which had died,

but there seems to be no evidence that this fungus was the cause of death. It was not, however, observed on other varieties of plum. The saprophyte *Merulius pinastri* frequently occurs in greenhouses and hothouses, and thrives so well in the moist, warm atmosphere as to become sometimes quite a pest. *Helminthosporium Warpuriae* appears to belong to the class of facultative parasites. It had gained entrance to the plant through a wound, and was growing further parasitically, but probably it is as a rule a saprophyte, and would not attack an uninjured plant.

The four following species are additions to the Flora of the Royal Gardens, Kew:—*Lepiota nauseosa*, Wakef., *Merulius pinastri* (Fr.) Burt, *Mastigosporium album*, Riess, var. *muticum*, Sacc., and *Helminthosporium Warpuriae*, Wakef.

The colour terms used are those of Ridgway's "Color Standards and Color Nomenclature."

Lepiota nauseosa, *Wakef.* sp. nov.

Pileus expansus, subumbonatus, carneo-ochraceus, circa 12 cm. diametro, adpresso-tomentosus, umbonem versus carneo-fulvus, areolato-rimosus; caro pilei crassa, albida, fracta vix flavescens. *Lamellae* latae, subdistantes, liberae, utrinque angustatae, e cremeo leviter roseo-tinctae. *Stipes* 16 cm. longus, 8-9 mm. diametro, pileo concolor sed tactu fulvescens, fibrillis paucis brunneis ornatus, sursum incrassatus, pallidus, deorsum vix bulbosus, albidus, intus solidus; caro stipitis albida fracta praesertim infra flavescens. *Annulus* superus, araneosus, fugax. *Sporae* hyalinae, globosae, basi apiculatae, 6·5-8 μ. *Odor* nauseosus.

On soil in Nepenthes House, Kew, Feb. 1918.

This fine species in general characters is near to the larger species of *Lepiota*, but it is remarkable for the delicate, cortinate annulus, in which respect it agrees with the genus *Cortinellus* of Roze. *L. Cortinarius*, Lange, has a similar veil, but is much smaller, and has different spores. The ground colour of the pileus is "light ochraceous buff" of Ridgway's system, whilst the tomentose scales about the disk are from fawn to hazel. The annulus is coloured like the pileus, but paler, and the fibrils on the stem are hazel. The whole fungus has a heavy, sickening odour.

Merulius pinastri, *Burt* in Ann. Miss. Bot. Gard. iv., 1917, p. 356.

Hydnum pinastri, Fr. Obs. Myc. I, p. 149.

A *Merulius* which is apparently this species occurred in abundance in the Tropical Pits at Kew in September, 1917, growing over benches, flower-pots, the cedar chips in which the pots are imbedded, and on an old piece of sacking. The Kew material, however, shows some features which are not mentioned in the description given by Burt. His description of the fructifications as "pinard yellow at first, then olive-ocher, the margin whitish," and of the spores as "pale ochraceous" applies only to small, young specimens, but even

in these there is frequently a tinge of pale flesh-pink in the marginal mycelium. In older specimens, which may extend for about 8 in. when growing under suitable conditions, as on the under side of a bench, the reddish colour of the mycelium is often quite pronounced, and may be best described as deep brownish vinaceous. It is due to a reddish colouring matter which is excreted from the hyphae, and is seen adhering to them in the form of small drops. The spores of old specimens are also more deeply coloured (fulvous), so that the hymenium eventually becomes from Dresden brown to raw umber. When dry the fructification is exceedingly thin and paper-like, with a rather broad, cobwebby margin.

Hymenium for a long time smooth, at length raised in shallow folds which form irregular, angular pores or reticulations, 0·5-1·5 mm. in diameter, or when growing on an upright surface may be prolonged as short teeth. Hyphae hyaline, 2-4 μ in diameter. Spores yellow-brown, elliptical, smooth, 5-7 × 4 μ (average 6 × 4 μ).

Lysurus borealis, (*Burt*) *P. Henn.* in Hedwigia xli, 1902, p. 173.

Typical specimens of this plant, agreeing exactly with Burt's description and figures of the American species, appeared on a heap of stable refuse in Chiswick, at intervals from September until the end of November, 1916, and again in the same place in September, 1917. It is characterised by having the arms of the receptacle beneath the gleba of a beautiful pale reddish colour, which is reproduced exactly in the coloured figure given by Murrill in Mycologia iv., Pl. LXVIII.

There have been two previous records of species of *Lysurus* in this country. The first was found at Kidderminster, and referred by Rea to *L. australiensis*, Cke. & Mass.* His figure represents it as having arms of a yellowish-brown, but he describes the colour as reddish-brown. Another specimen found at Manchester by Mr. H. Murray had red arms, and was named by Lloyd *L. borealis*.† If the descriptions of *L. australiensis* and *L. borealis* be compared, it is obvious that the plants are very close, and the question arises whether the names be synonymous. The chief difficulty is due to this question of the colour of the receptacle.

The original description of *L. australiensis* gives "receptaculo fusco," but as it was probably drawn up from dried material, little weight can be attached to this statement. Later descriptions, also, for the most part, say little about the colour of the plant. An enquiry as to this point was therefore sent to Dr. J. B. Cleland, of Sydney, who is working out the Basidiomycetes of New South Wales. Dr. Cleland states in reply that the Australian plant is usually entirely white, but that he has seen one large specimen (4 in. high and 1 in. thick), in which the arms were orange, the upper part of the stem paler orange, and the base whitish. There is also in the Kew Herbarium a

* Trans. Brit. Myc. Soc. ii, 1903, p. 57.

† Lloyd, Syn. Phall. 1909, p. 40.

pencil sketch of a *Lysurus* by the late F. M. Bailey, on which he noted that the arms had a "rose-coloured border."

It seems, therefore, that *L. australiensis*, though typically entirely white except for the gleba, may occasionally vary in the direction of developing some colour in the arms of the receptacle.

On the other hand, the American and European plant has usually distinctly reddish arms. An entirely white form, however, has been recorded from Mecklenburg, Germany, and named by Hennings *L. borealis*, var. *Klitzingii*.* In this connection it may also be noted that when eggs of the Chiswick plant were allowed to develop indoors, the red colour was absent, suggesting that it is dependent on the presence of sufficient light.

Difference of illumination, however, will not account for the fact that the Australian *Lysurus* is normally entirely white, while the plant of the northern hemisphere has normally red arms. If they be regarded as two distinct species, Hennings' var. *Klitzingii* should be referred to as a synonym of *L. australiensis*. But except for this colour difference, the plants appear to be indistinguishable, and it seems more probable that they represent geographical forms of one species. In view of the fact that the difference is fairly constant, it is nevertheless desirable to keep the distinctive name *borealis* for the red Northern form.

The further suggestion, made by both Lloyd † and Cleland,‡ that *L. borealis* and *L. australiensis* are identical with *L. Gardneri*, Berk., of Ceylon, does not appear to be justified. According to Petch § the arms of *L. Gardneri* (referred by him to *Colus*) are always united at the apex, a condition which is only exceptional in *L. australiensis*. Furthermore, the gleba in *L. Gardneri* does not as a rule extend to the base of the arms, whereas it always does so in *L. borealis* and *L. australiensis*. No red form of *L. Gardneri* has ever been recorded.

Nectria fusco-purpurea, *Wakef.*, sp. nov.

Stromata dilute lateritia, ceracea, applanata, 4-8 mm. longa, 1-2 mm. lata, per rimas transversas corticis erumpentia, primo conidia gerentia. *Conidia* cylindrica, utrinque obtusa, vix curvula, 8-11 × 2-2·5 μ. *Conidiophora* simplicia vel ramosa, hyalina, 1·5-2 μ diametro. *Perithecia* dense constipata, compressione laterali deformia,, stroma obscurata, sessilia, fusco-purpurea, carnosula, contextu parenchymatico rubro, sicco collapsa,' pezizoidea, rugulosa, 0·25 mm. diametro, ostiolo minuto pertusa. *Asci* cylindracei, octospori, 80-90 × 10-12 μ. *Paraphyses* filiformes, ramosae, hyalinae, 1·5 μ diametro. *Sporae* monostichae vel subdistichae, variabiles, oblongae, utrinque obtusae, medio 1-septatae, interdum 2-3-septatae, ad septa constrictae, 14-33 × 4·5-8·5 μ.

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* Hedwigia xli., 1902, p. 173.

† Lloyd in Myc. Notes, No. 28, p. 370. Lloyd corrected this opinion in his Syn. Phall., but reverted to it in Myc. Notes No. 41, p. 571.

‡ Cleland and Cheel in Journ. and Proc. Roy. Soc. New South Wales, xlix, 1915, p. 204.

§ Ann. Roy. Bot. Gard. Peradeniya, iv., p. 174.

On dead branches of plum (Pond's Seedling), Wisbech, coll. *J. C. F. Fryer*, 1917; *A. D. Cotton*, 1917.

While most of the spores have only one septum, occasional large spores with two or three septa are present, suggesting relationship with the genus *Calonectria*. Frequently one or more cells of these larger spores are much swollen, as in Saccardo's figures of abnormal spores of *Calonectria varians*.

The transversely elongated stromata give the species a habit markedly different from that of the other British Nectrias. The conidial stage is bright pink, but the stroma is eventually almost completely hidden by the crowded perithecia which are dark brownish-purple to the naked eye, but whose walls are red by transmitted light.

Cercosporella Antirrhini, *Wakef.*, sp. nov.

Maculae orbiculares, depressae, ex atro-viridi pallidae, arescentes, 2-4 mm. diametro. *Acervuli* epiphylli, sparsi, minuti, albidi vel demum conglutinati, subhyalini, dilute roseo-tincti. *Conidiophora* dense constipata, hyalina, ramosa, 2-4 μ diametro. *Conidia* hyalina, elongato-obclavata, curvula, 25-48 × 2·25-3·5 μ, ad 3-septata.

Hab. On living leaves and stems of garden Antirrhinums, Worcester, Sept., 1917; also Birmingham, June, 1918, *W. B. Grove*.

The fungus attacks the still living, vigorous leaves and stem, forming small sunken patches having a darker green waterlogged appearance. Under the lens the minute sori are seen scattered all over the patch, whitish and pulverulent at first, but in the presence of abundant moisture becoming agglutinated and pale rose-coloured. Later the spots dry out from the centre, becoming pale alutaceous and thereby more definite and conspicuous.

Mastigosporium album, var. **muticum,** *Sacc.* Ann. Myc., 1911, p. 254.

Distinguished from the type form by the conidia having no cilia and being slightly smaller. Conidiophores 13-15 × 3-5 μ. Conidia 32-38 × 10-12 μ, oblong-elliptical, rounded at both ends, 3-septate.

On leaves of *Dactylis glomerata*, Kew, 1918, and Oxshott, Oct., 1917.

Helminthosporium Warpuriae, *Wakef.*, sp. nov.

Mycelium atro-olivaceum, lanosum, effusum. *Conidiophora* rigida, erecta, umbrina, apice rotundata vix dilatata, 300-500 × 6-8 μ. *Conidia* solitaria, obclavata, apice obtusa, pallide grisea, crasse tunicata, 8-11-septata, 115-190 × 12-14 μ.

On an injured stem of *Warpuria clandestina*, Stapf, Tropical Pits, Kew, July, 1917.

XXIX.—NEW ORCHIDS: DECADE XLVI.

451. **Pleurothallis** (§ **Macrophyllae Racemosae**) **grandis,** *Rolfe*; affinis *P. lamellariis*, Lindl., sed scapis longioribus erectis et floribus duplo majoribus facile distinguenda.

Herba epiphytica, circiter 50 cm. alta. *Caules* elongati, cylindrici, 30-40 cm. longi, vaginis paucis tubulosis carinatis 7-9 cm. longis obtecti. *Folia* sessilia, subcordata-ovata, subobtusa, coriacea, 17-22 cm. longa, 9-17 cm. lata. *Spatha* lanceolata-oblonga, acuta, conduplicata, 3 cm. longa. *Scapi* erecti, 45 cm. longi; racemi multiflora. *Bracteae* ovatae, subacutae vel apiculatae, conduplicato-concavae, circiter 1 cm. longae. *Pedicelli* arcuati, verruculosi, 1·5 cm. longi. *Flores* secundi, patentes, pro genere magni, brunneo-suffusi. *Sepalum* posticum suberectum, lineari-lanceolatum, subobtusum, 2·8 cm. longum, basi subconcavum, margine revolutum; *sepala* lateralia alte connata, oblonga, subconcava, 3 cm. longa, 1·2 cm. lata, apice biloba, lobis subobtusis. *Petala* parallela, oblonga, obtusa, coriacea, 1 cm. longa, supra medium valde incurva. *Labellum* ovato-oblongum, obtusum, ·2 cm. longum, basi dilatatum, ad latera involutum et verruculosum, apice abrupte incurvum; discus carnosus. *Columna* clavata, 5 mm. longa.

Central America. Costa Rica; near Cachi, *C. H. Lankester*, 3.

A large and very distinct species which flowered at Kew in September, 1917, and in August, 1918. The flowers are borne in a one-sided raceme, the ground colour being green, more or less suffused and striped on the sepals with brownish red.

452. **Bulbophyllum robustum,** *Rolfe* in Bot. Mag. sub. t. 8000, sine descriptione; affine *B. crenulato*, Rolfe, sed habitu robustiore, sepalis lateralibus angustioribus et ovarii carinis integris differt.

Rhizoma repens, validum, vaginis ovatis ancipitibus acutis imbricatis obtecta. *Pseudobulbi* tetragoni, acutanguli, oblongi vel ovoideo-oblongi, 4-6 cm. longi, 1·5-2 cm. lati, diphylli. *Folia* elliptico-oblonga, subobtusa, coriacea, 12-22 cm. longa, 2-3 cm. lata. *Scapi* suberecti, 15-25 cm. longi, vaginis tubuloso-spathaceis obtecti; spica patens vel recurva, oblonga, crassa, densiflora, 6-8 cm. longa, circiter 1·5 cm. lata, rachi alveolata. *Bracteae* late ovatae, subobtusae, 3 mm. longae. *Pedicelli* crassissimi, 3 mm. longi. *Flores* parvi, carnosi, 4-5 mm. longi. *Sepalum* posticum inflexum, ellipticum, obtusum; *sepala* lateralia connata; limbus late ovatus, obtusus, papillosus, margine crenulatus. *Petala* triangulari-linearia, obtusa, hyalina, 1·5 mm. longa. *Labellum* orbiculare, emarginatum, crassum, 2·5 mm. latum, basi subcordatum. *Columna* brevissima; alae subulato-oblongae, subacutae, 0·5 longae.

Madagascar. Central district; without exact locality, *Rev. R. Baron*, 2324, 2723.

A plant of this species, received from the Royal Botanic Gardens, Glasnevin, 1914, without a name, flowered in the Kew collection in May, 1917. The sepals are green, with many more

or less confluent brown spots; the petals, hyaline with a purple stripe; the lip is dull green, and sunk in a cavity formed by the united lateral sepals.

453. **Maxillaria parviloba,** *Rolfe*; affinis *M. leucaimaitae* Rodr., sed foliis angustioribus, sepalis petalisque longioribus, et labello breviore differt.

Herba epiphytica. *Pseudobulbi* aggregati, oblongi, subcompressi, 5 cm. longi, 2 cm. lati, diphylli. *Folia* subpetiolata, lorata, subacuta, circiter 35 cm. longa, 3 cm. lata, basi angustata. *Scapi* suberecti, 9-12 cm. longi, vaginis spathaceis lanceolato-oblongis obtecti. *Bracteae* spathaceae, lanceolato-oblongae, subobtusae, 3 cm. longae, 3 cm. latae. *Flores* mediocres. *Sepalum* posticum lanceolato-oblongum, acutum, subconcavum, 4 cm. longum; *sepala* lateralia subpatentia, 4 cm. longa, basi in mentum brevissimum obtusum extensa. *Petala* subfalcata, lineari-oblonga, acuminata, 2·5 cm. longa. *Labellum* circiter 1·3 cm. longum, breviter trilobum; lobi laterales falcato-oblongi, obtusi, 2·5 mm. lati; lobus medius ovato-oblongus, obtusus, crassus, 3·5 mm. longus, margine recurvus, facie papillosus; callus oblongus, obtusus, crassus. *Columna* clavato-oblonga, 1 cm. longa.

Habitat believed to be Peru.

Flowered in the establishment of Messrs. Sanders, St. Albans, in May, 1917. The flowers are light yellow, with a faint pink suffusion in the sepals and petals; lip white, suffused with brownish pink on the side lobes, and the front lobe dusky brown on the face, red-purple behind, and with a narrow yellow margin; apex of crest yellow.

454. **Chrysocycnis Lehmanii,** *Rolfe*; affinis *C. Schlimii*, Lind. et Reichb. f.; labello elliptico-oblongo basi late auriculato nec ovato et anguste sagittato differt.

Herba epiphytica. *Caulis* scandens, validus, 0·5-0·7 cm. latus, vaginis ovatis subimbricatis obtectus; internodii 6·15 cm. longi. *Pseudobulbi* oblongi, subcompressi, 2·3 cm. longi, 0·5-0·7 cm. lati, monophylli. *Folia* breviter petiolata, ovato-elliptica vel subcordato-elliptica, obtusa, coriacea, 8-14 cm. longa, 4-8 cm. lata; petiolus circiter 1 cm. longus. *Scapi* axillares, 4-5 cm. longi, vaginis ovato-lanceolatis acutis obtecti, uniflori. *Bracteae* spathulatae, ovato-lanceolatae, acuminatae, 2 cm. longae. *Flores* ampli, ochracei vel pallide rosei. *Sepalum* posticum lanceolato-oblongum, acutum, incurvum, 2·5 cm. longum; *sepala* lateralia patentia, ovato-oblonga, acuta, 2·5 cm. longa. *Petala* falcato-oblonga, obtusa, subreflexa, 2 cm. longa. *Labellum* hastatum, 1 cm. longum; lobus intermedius elliptico-oblongus, obtusus, subconcavus, leviter carinatus; lobi laterales late auriculati, 3 mm. lati. *Columna* clavata, incurva, 1·3 cm. longa, alis brevissimis latis.

Ecuador. Banos; on the Tunguaragua Volcano, 1600-2300 m., *Lehmann*, 8252.

Lehmann's drawing shows the flowers ochraceous or with a

faint shade of pink, and the column light green with a few minute transverse light brown spots.

455. **Listrostachys floribunda,** *Rolfe*; a *L. muscicola*, Rolfe, foliis longioribus subrecurvis et bracteis duplo minoribus facile distinguenda.

Herba epiphytica, nana, subacaulescens. *Folia* disticha, approximata, lineari-oblonga, subrecurva, oblique et brevissime bidentata, subcoriacea, 9-13 cm. longa, 1-1·2 cm. lata, lobis obtusis. *Scapi* suberecti, graciles, 8-12 cm. longi, 6-8-flori. *Bracteae* ovato-oblongae, subobtusae, conduplicato-concavae, submembranaceae, 4-5 mm. longae. *Pedicelli* graciles, circiter 2 cm. longae. *Flores* mediocres, albi. *Sepala* patentia, apice recurva; posticum elliptico-lanceolatum, acutum, 0·8 cm. longum; lateralia oblongo-lanceolata, acuta, 0·9 cm. longa. *Petala* recurva, lineari-oblonga, acuta, 0·7 cm. longa. *Labellum* deltoideo-ovatum, acutum, 0·8 cm. longum, apice recurvum, prope basin leviter constrictum; calcar 6 cm. longum, gracillimum, curvatum. *Columna* lata, 4 mm. longa; pollinia globosa; stipites gracillimi, 1·5 mm. longi; glandula squamata.

Tropical Africa. Uganda; at Umpala.

Received from the Department of Agriculture, Uganda, in 1916, and flowered at Kew in September, 1917. The flowers are white, tinged with buff on the elongated slender spurs.

456. **Vanilla Havilandii,** *Rolfe*; a *V. albida*, Bl., racemis longioribus, bracteis numerosis subaggregatis differt.

Herba scandens. *Folia* petiolata, anguste elliptica vel elliptico-lanceolata, acuminata, subcoriacea, 10-17 cm. longa, 2·5-5 cm. lata; petiolus circiter 1 cm. longus. *Racemi* axillares, 3-4 cm. longi, multiflori *Bracteae* numerosae, subaggregatae, suborbiculares vel ovato-oblongae, obtusae, concavae, 3-4 mm. longae. *Pedicelli* 4-5 cm. longi. *Flores* circiter 3 cm. longi. *Sepala* elliptico-oblonga, obtusa, 3 cm. longa. *Petala* oblanceolato-elliptica, obtusa, 3 cm. longa, basi subattenuata. *Labellum* circiter 3 cm. longum, tubo brevi; limbus dilatatus, subintegerlate rotundatus, repando-lobulatus, crenulatus, infra apicem lineis incrassatis et integris notatus; crista oblonga, lamellis fimbriatis subdensis composita. *Columna* circiter 2 cm. longa, alis angustis. *Fructus* subcylindricus, 11-15 cm. longus.—*V. albida*, Ridl. in Journ. Linn. Soc. xxxi. p. 303; Rolfe, l.c. xxxii. p. 459: non Bl.

Borneo. Kuching, *Dr. Haviland*. Sarawak; Matang, at edge of the tea estate; "flowers green; lip white, larger than petals, with the central bar elevated," *H. N. Ridley*.

Hitherto referred, somewhat doubtfully, to the Javan *V. albida*, Bl., though when monographing the genus I called attention to the more numerous bracts of Dr. Haviland's fruiting specimen, the only one seen. A specimen subsequently collected by Mr. Ridley has quite identical bracts, and as there are both flowers and fruits, it appears to represent a distinct but allied species. Unfortunately the only specimen of the Javan plant at

Kew is without flowers and fruit, so that comparison has had to be made with drawings of these organs.

457. **Vanilla andamanica,** *Rolfe*; a *V. albida*, Bl., foliis angustioribus, floribus majoribus et labelli disco prope apicem verrucoso differt.

Herba scandens. *Folia* petiolata, oblongo-lanceolata, acuminata, subcoriacea, 14-19 cm. longa, 2·5-4 cm. lata; petiolus 1-1·5 cm. longus. *Racemi* axillares, 2-3 cm. longi, multiflori. *Bracteae* ovato-oblongae, obtusae vel subacutae, 4-5 mm. longae. *Pedicelli* circiter 2 cm. longi. *Flores* circiter 5 cm. longi. *Sepala* oblongo-lanceolata, subobtusa, circiter 5 cm. longa. *Petala* oblanceolato-elliptica, obtusa, basi subattenuata, circiter 5 cm. longa. *Labellum* 5 cm. longum; tubo basi angusto; limbus subinteger, ovato-rotundatus, repando-lobulatus, crenulatus, infra apicem lineis vel venis verruculosis instructus; crista obovoideo-oblonga, e lamellis densis fimbriatis composita. *Columna* 3·5 cm. longa, alis rotundatis.

Tropical Asia. Andaman Islands; at Betapur Valley, *C. E. Parkinson*, 1139.

Sent for determination from the Forest Research Institute and College, Dehra Dun. It has much the general appearance of the Javan *Vanilla albida*, Bl., but the flowers are considerably larger, and the tube of the lip longer and much narrowed at the base, while the crest is denser, and the three central nerves of the lip are thickened and verrucose near the apex. A fruiting specimen has not been seen.

458. **Peristylus ugandensis,** *Rolfe*; a *P. Petitiano*, A. Rich., floribus minoribus, labello breviter trilobo, non tripartito, differt.

Herba terrestris, foliosa, 35-45 cm. alta. *Folia* sessilia, elliptica vel ovato-elliptica, subacuta, 7-nervia, 3-7 cm. longa, 1·5-3 cm. lata. *Spicae* 5-12 cm. longae, angustae, densae, multiflorae. *Bracteae* ovato-lanceolatae, acutae vel acuminatae, 0·5-1 cm. longae. *Flores* parvi, flavo-virides. *Sepala* subconniventia, elliptico-ovata, subobtusa, 2·5-3 mm. longa. *Petala* elliptico-ovata, subobtusa, 2-2·5 mm. longa. *Labellum* late oblongum, breviter trilobum, carnosulum, 3 mm. longum; lobi oblongi, circiter 1 mm. longi; discus carinatus; calcar late oblongum, vix 1 mm. longum. *Columna* lata, vix 1 mm. longa.

Tropical Africa. Uganda; bushy highlands at Lamaru, 3000 m., *Scheffler*, 244.

459. **Peristylus Snowdenii,** *Rolfe*; a *P. ugandensi*, Rolfe, floribus majoribus, labello latiore et calcare saccato-globoso differt.

Herba terrestris, foliosa, 35-45 cm. alta. *Folia* sessilia, ovata, subacuta, undulata, 7-nervia, 3-5 cm. longa, 2·5-3 cm. longa. *Spicae* 10-12 cm. longae, angustae, densae, multiflorae. *Bracteae* ovato-lanceolatae, acuminatae, 0·6-1·2 cm. longae. *Flores* parvi, flavo-virides. *Sepala* late oblonga, obtusissima, 3-3·5 cm. longa.

Petala late oblonga, obtusissima, 2·5-3 cm. longa. *Labellum* subquadratum, trilobum carnosulum, 3 mm. longum; lobi oblongi, subobtusi, 1 mm. longi; disci laeves; calcare saccato-globosum, 1 mm. longum. *Columna* lata, vix 1 mm. longa.

Tropical Africa. British East Africa; short grass land at Limuru, 2250 m., "flowers greenish yellow with brown rostellum," *J. D. Snowden*, 554.

460. **Habenaria Hunteri,** *Rolfe*; inter species africanas floribus magnis, labello amplo trilobo, lobis lateralibus amplissimis fimbriatis, et lobo intermedio lineari facile distinguenda.

Caules validi, 30 cm. longi, foliosi. *Folia* sessilia, lanceolato-oblonga vel elliptico-oblonga, acuta vel acuminata, undulata, subrecurva, 7-20 cm. longa, 3-4 cm. lata, superne decrescentia. *Racemus* subsessilis, triflorus. *Bracteae* ovatae, acuminatae, 2·5-3 cm. longae. *Pedicelli* 4-4·5 cm. longi. *Flores* magni, albi. *Sepalum* posticum erectum, ovatum, subobtusum, concavum, 1-8 cm. longum, 1 cm. latum; *sepala* lateralia patentia, oblique ovata, subobtusa, 2 cm. longa, 1 cm. lata. *Petala* integra, oblongo-lanceolata, acuta, 1·5 cm. longa, cum sepalo postico in galeam conniventia. *Labellum* breviter unguiculatum; unguis patens; limbus trilobus, late flabellatus, 3·5 cm. latus; lobus intermedius oblongus, obtusus, 1·5 cm. longus; lobi laterales patentes, oblique obovato-flabellati, inciso-fimbriati, 1·5 cm. longi, 2·2 cm. lati; calcar cylindricum, spiraliter curvatum, 13-15 cm. longum. *Columna* 0·7 longa; pollinia clavata, 3 mm. longa; caudiculi gracillimi, 0·8 cm. longi, curvati. *Stigmata* subparallela, late clavato-oblonga, subcurvata, 5 mm. longa; rostellum trilobum; lobus intermedius triangulari-ovatus, obtusus, 5 mm. longus; lobi laterales curvati, 5 mm. longi.

Tropical Africa. Gold Coast; without precise locality, *T. Hunter*.

A striking species, in habit not unlike *H. leonensis*, Kränzl., but the large flowers bear a strong general resemblance to those of *H. Susannae*, R. Br. Their colour is white, with green stigmas. The tubers were received from Mr. T. Hunter, Senior Curator of the Gold Coast Botanical Department, in 1915, and the plants flowered in the Kew collection in August, 1917.

XXX.—DECADES KEWENSES

Plantarum Novarum in Herbario Horti Regii Conservatarum.

DECAS XCI.

901. **Pygeum sisparense,** *Gamble* [Rosaceae-Pruneae]; species *P. acuminato*, Colebr., affinis, foliis minoribus et racemis brevioribus, etiam staminibus paucioribus differt.

Arbor parva, ramulis siccitate fere nigris rugosis. *Folia* lanceolata, apice acuta, basi in petiolum attenuata, marginibus recurvis prope basin glandulis 2 parvis aliquando munita, 5-10 cm. longa, 2-4 cm. lata; nervi utrinque circiter 8, obliqui;

petiolus 1·5 cm. longus. *Racemi* axillares, 4-5 cm. longi, crispato-puberuli; pedicelli 2 mm. longi; flores parvi, bracteolis minutis suffulti. *Calycis tubus* late campanulatus, lobis 5 ovatis minutis pubescentibus. *Petala* 5, oblonga, pubescentia, calycis lobis fere duplo longiora. *Stamina* circiter 20, filamentis gracilibus incurvis alternatim longis et brevibus. *Ovarium* glabrum, stylo perbreve. *Drupa* transverse oblonga, glabra, violacea, circiter 1·5 cm. longa, 2 cm. lata.

South India. In forests on the South West side of the Nilgiri plateau, about Sispara, at 1920-2250 m., *Gamble*, 14339, 14472, 20582, 20637 (collected in 1884 and 1889).

902. **Eugenia discifera,** *Gamble* [Myrtaceae-Myrteae]; *E. calcadensi*, Bedd., affinis, pedicellis brevioribus epedunculatis, e ramulis infra folia ortis, foliis subtus siccitate griseis differt.

Arbor parva, ramulis teretibus pallidis, ultimis sicut inflorescentia molliter ferrugineo-pubescentibus. *Folia* obovata, apice abrupte obtuse acuminata, basi acute attenuata, parce pubescentia, subtus grisea, 5-6 cm. longa, 2-3 cm. lata, nervis utrinque circiter 12-15 irregularibus haud conspicuis sub marginem arcuatim junctis; petiolus 5-10 mm. longus, laminae marginibus decurrentibus notatus. *Flores* parvi, bini e ramulis novis infra folia orti, epedunculati; pedicelli graciles, 5-7 mm. longi; bracteolae ad basin calycis 2, lanceolatae, 2 mm. longae. *Calycis* lobi rotundati, pubescentes, ciliati, 2·5 mm. longi. *Petala* orbicularia, pellucide punctata, fere glabra. *Discus* staminifer conspicuus, villosus, 3-5 mm. latus. *Fructus* ignotus.

South India. Evergreen forests of the Western Ghats in Travancore, near Chimunji, 1300 m., April, 1895, *T. F. Bourdillon*, 580, 787.

903. **Jambosa Bourdillonii,** *Gamble* [Myrtaceae-Myrteae]; *Eugeniae hemisphericae*, Wight, affinis, foliis subtus conspicue nervosis, cymis brevissimis calycis tubo campanulato differt.

Arbor mediocris, glaber, ramulis teretibus griseis. *Folia* chartacea, elliptico-oblanceolata, apice acuminata acumine obtuso, basi cuneata, 8-12 cm. longa, 3-4 cm. lata, nervis utrinque 8-10 fere rectis in nervum intramarginalem fere 3-5 mm. e margine distantem junctis supra obscuris infra conspicuis; petiolus brevis, crassus, circiter 3 mm. longus. *Cymae* terminales vel aliquando laterales, subsessiles, pauciflorae, vix 3 cm. longae; pedicelli 5 mm. longi, subtetragoni. *Calycis tubus* campanulatus, ad 1 cm. longus; lobi rotundati, 3 mm. longi, fructiferi recurvi. *Petala* 4, orbicularia, circiter 7 mm. diametro, conspicue sed sparse glanduloso-punctata. *Fructus* maturus nondum visus, immaturus hemisphericus, disco conspicue coronatus.

South India. In the evergreen forests of Travancore about Merchiston, at 660 m., April, 1895, *T. F. Bourdillon*, 596, 859.

904. **Jambosa courtallensis,** *Gamble* [Myrtaceae-Myrteae]; species distincta, quoad foliorum nervationem *Eugeniae Mundagam*, Bourdillon, affinis, sed foliis multo minoribus basi rotundatis nec cordatis, calycis tubo elongato subcylindrico differt.

Arbor ramulis superne pallide brunneis subtetragonis. *Folia* opposita coriacea, elliptica, obtusa vel obtuse acuta, ad basin rotundata vel paullo attenuata, glabra, 7-13 cm. longa, 4-6·5 cm. lata, nervis utrinque circiter 8 distantibus curvatis et arcuatim junctis, nervulis alteris minoribus marginem versus adjunctis, reticulatione conspicua; petiolus brevissimus, 3-4 mm. longus, crassus. *Cymae* terminales, trichotomae; pedunculi 10-15 mm. longi, crassi; pedicelli plus minusve recurvati. *Calycis tubus* subcylindricus, superne paullo ampliatus, 12-15 mm. longus, fauce 7-8 mm. diametro, disco annulari munitus; lobi 4, ovati, quorum 2 margine subhyalino, 3-4 mm. longi, recurvi. *Petala* 4, orbicularia, patentia. *Stamina* numerosa, filamentis 10-15 mm. longis. *Ovarium* calycis tubi basin versus 2-locellatum, ovulis numerosis; stylus longus, stigmate minuto. *Fructus* ignotus.

South India. Courtallum, Tinnevelly hills, *Wight* (K. D. 1054). Ceylon. *J. Fraser*, 111.

905. **Syzygium palghatense,** *Gamble* [Myrtaceae-Myrteae]; *S. calophyllifolio*, Walp., affine, foliis obovatis abrupte obtuse acuminatis conspicue glandulosis, et calyce infundibuliformi elongato differt.

Arbor procera, ramulis brunneis ultimis subtetragonis. *Folia* coriacea, obovata, apice abrupte obtuse acuminata, basi cuneata fere sessilia, conspicue glanduloso-punctata, 3·6-4·5 cm. longa, 1-2 cm. lata, marginibus reflexis, nervis utrinque circiter 10-12 vix prominulis. *Cymae* terminales vel in axillis foliorum ultimorum, pauciflorae, ad 4 cm. longae, pedicellis subtetragonis. *Calycis* tubus elongatus, infundibuliformis, fere 1 cm. longus, lobis rotundatis 1 mm. longis. *Petala* calyptratim decidua. *Fructus* maturus ignotus.

South India. In the Palghat hills of Malabar, at 1625 m., *Beddome*, 254.

906. **Syzygium travancoricum,** *Gamble* [Myrtaceae-Myrteae]; nulli specierum aliarum peraffine, foliis longe petiolatis, cymis axillaribus longe pedunculatis et longe ramulosis floribus parvis insignis.

Arbor, ramulis tetragonis. *Folia* chartacea, ovata, apice obtusa acumine plicato, basi angustata in petiolum 1·5-2 cm. longum decurrentia, 8-10 cm. longa, 5-6 cm. lata, nervis utrinque 10-15 irregularibus distantibus, intra marginem arcuatim junctis sine nervo intramarginali conspicuo. *Cymae* axillares, ad 15 cm. longae, corymbosae; pedunculus communis 5-8 cm. longus, rami etiam longi; flores parvi. *Calycis tubus* brevis, vix 1 mm. diametro; lobi perbreves. *Petala* verosimiliter calyptratim decidua. *Fructus* ignotus.

South India. In swampy places in the low country of Travancore, up to 65 m., March, 1895, *T. F. Bourdillon*, 540.

From the specimen in Herb. Kew this seems to be the *Eugenia montana* of Bourdillon in "Forest Trees of Travancore," p. 186, but as Sir Dietrich Brandis has pointed out in a note attached to the specimen, it is quite distinct from *E. montana*, Wight, which is a tree of high level Sholas of the Nilgiris.

907. **Meteoromyrtus,** *Gamble*, gen. nov.; *Eugeniae*, Linn., affinis, differt praecipue ovulis ab apice ovarii loculorum pendulis circiter 4.

Arbor parva vel arbuscula. *Folia* opposita, membranacea, penninervia, juventute villosa. *Flores* parvi, pedicellis unifloris axillaribus vel supra-axillaribus villosis; bracteolae lineares 2 infra calycem et calyce longiores. *Calycis tubus* brevis ad faucem disco munitus, lobis 4 lanceolatis villosis corollae paullo longioribus. *Petala* 4, suborbicularia, pellucido-punctata. *Stamina* indefinita, annulo ad marginem disci inserta; antherae parvae, rimis longitudinalibus. *Ovarium* biloculare, ovulis circiter 4 in utroque loculo ab apice pendulis; stylus elongatus; stigma subcapitatum. *Fructus* maturus ignotus. *Species* unica.

M. wynaadensis, *Gamble*, comb. nov. *Eugenia wynaadensis*, Beddome in Madr. Lit. Soc. Journ. ex Ic. Pl. Ind. Or. 35, t. 161; Fl. Sylv. Anal. Gen. cx; Fl. Br. Ind. ii. 506.

South India. Common about Devala in the South-East Wynaad, at 650-960 m., *Beddome*.

Both Beddome in his Icones, and Duthie in the Fl. Brit. India have signalized this species as being probably the type of a new genus, and so I have no hestitation in describing it as such in spite of the poor material, in order to bring the plant into its proper place in the Madras Flora.

908. **Osbeckia lineolata,** *Gamble* [Melastomaceae-Osbeckieae]; *O. minori*, Triana, affinis, foliis majoribus ellipticis siccitate flavescentibus ad superficiem superiorem lineolis conspicuis apice setoso-mucronatis ornatis, floribus et fructibus majoribus differt.

Suffrutex erectus, lignosus, ramulis plus minusve angulatis glaucis ultimis flavescentibus quadrangularibus. *Folia* elliptica, siccitate flavescentia, apice acuta, basi acuta rotundata vel subcordata, 3-5 cm. longa, 1·5-2·5 cm. lata, et basi tricostata, addito nervorum intramarginalium pari inconspicuorum, nervis et nervulis transversis haud conspicuis in facie lineolis latis conspicuis apice breve mucronatis ornata, infra glabra; petiolus circiter 2 mm. longus. *Flores* in racemos 1-2 paucifloros terminales additis aliquando 1-2 axillaribus; bracteae et bracteolae ovatae, mucronatae, margine parce setoso-ciliatae, deciduae. *Calycis* tubus urceolatus, setis hispidis simplicibus curvatis ornatus; lobi 5, ovato-acuminati, praeter margines ciliatos et carinam hispidam glabri, 3 mm. longi, intra lobos appendices triangulares apice fasciculato-setosi. *Petala* 5, insigniter purpurea, latissime obovata, margine ciliata, 1 cm. longa et lata. *Antherae* circiter 5 cm. longae; filamenta 7 mm. longa. *Ovarium* apice dense setosum, stylo superne incrassato. *Capsula* cylindrica, glauca, 7 mm. longa, parce setosa.

South India. Nilgiri hills, *Gardner*; Pulney Hills, 1980-2300 m., *Wight* (K. D. 1090); near Kodaikanal and Perumal, *Bourne*, 68, 968, 1532; Shembag, *Saulière*, 150, 312.

909. **Osbeckia courtallensis,** *Gamble* [Melastomaceae-Osbeckieae]; *O. Kleinii*, Wight et Arn., quoad setas calycinas affinis, foliis minoribus ellipticis nec lanceolatis, et inflorescentia pauciflora differt.

Suffrutex humilis sed lignosus, ramulis teretibus pallide brunneis ultimis subquadrangularibus hispidis. *Folia* elliptica, apice acuta acumine reflexo, basi obtusa, 2-4 cm. longa, 1-2 cm. lata, basi tricostata, margines versus addito nervorum pari inconspicuorum, nervis et nervulis transversis inconspicuis, utrinque setis hispidis infra adnatis supra liberis ornata; petiolus circiter 3 mm. longus. *Flores* in racemos pauci-(3-4-) floros terminales vel axillares; bracteae et bracteolae orbiculares, ciliatae, deciduae. *Calycis* tubus campanulatus, infra setis simplicibus hispidis supra fasciculatis ornatus; lobi 5, ovati, obtusi vel retusi, margine etiam ad medium dorsi ciliato-hispidi, apice fasciculatim longe-setosi; appendices columnares intra lobos siti, apice fasciculato-setosi. *Petala* 5, purpurea, suborbicularia, apice ciliata, 6-7 mm. longa. *Antherae* 7 mm. longae. *Ovarium* dense aureo-setosum, stylo subulato-incrassato. *Capsula* cylindrica, glabra, 10-costata et transverse nervosa, 7-8 mm. longa.

South India. Courtallum, in Tinnivelly, *Wight* (K. D. 1103).

910. **Osbeckia Lawsoni,** *Gamble* [Melastomaceae-Osbeckieae]; *O. Kleinii*, Wight et Arn., affinis, calycis lobis acutis et foliis minoribus differt.

Suffrutex humilis, ramulis tetragonis ultimis hispidis. *Folia* lanceolata, apice acuminata et mucronata, basi acuta, 2-5 cm. longa, 1-1·5 cm. lata, basi tricostata, ad margines addito nervorum pari gracilium inconspicuorum, nervis et nervulis transversis inconspicuis, supra setis gracilibus paucis inferne adnatis ornata, infra ad nervos et sparsim intra nervos hispida; petiolus circiter 3 mm. longus. *Flores* in racemos terminales paniculatos circiter 2-5 floros; bracteae ovatae, acuminatae, hispidissimae; bracteolae ovatae, obtusae, dorso et margine hispidae, deciduae. *Calycis* tubus campanulatus, infra setis simplicibus curvatis supra fasciculatis ornatus; lobi 5, triangulares, acuti, ad apicem setis pectinatis paucis, dorso fere glabri; appendices intra lobos siti cylindrici, apice parce setosi. *Petala* 5, purpurea, late obovata, vix ciliata, circiter 15 mm. longa. *Antherae* curvatae, 7 mm. longae. *Ovarium* infra glabrum, supra longe albo-setosum. *Capsula* cylindrica, hispida, 6 mm. longa.

South India. Murchison, in Travancore, at 650 m., Dec., 1893, *Lawson*, 46.

XXXI.—MISCELLANEOUS NOTES.

T. A. Dorrien-Smith.—It is with great regret that we have to record the death of Mr. Thomas Algernon Dorrien-Smith, Lord Proprietor of the Scilly Islands, in his 73rd year, on August 6th. Mr. Dorrien-Smith made the gardens at Tresco Abbey famous by adding extensively to the remarkable collections

of plants accumulated by his predecessor. He was a frequent visitor to Kew, and a generous contributor of plants to the Gardens. Mr. Dorrien-Smith was always glad to receive plants from Kew which could only be grown here under glass, but which in most cases have flourished under the more genial conditions at Tresco. Among the more striking plants which are the pride of the gardens may be mentioned the South African Mesembryanthemums, Agaves from Mexico, Puyas, tree Echiums and Pelargoniums all growing there with astonishing vigour. The remarkable collection of New Zealand and Australian plants under cultivation (largely made by his son, Major A. A. Dorrien-Smith), afford, perhaps, a greater proof of Mr. Dorrien-Smith's success as a cultivator and of the keen interest he took in the acclimatisation of plants unknown to most British gardens.

The conditions at Tresco are no doubt somewhat similar to those of some parts of New Zealand, and it was particularly gratifying to him to find that many plants of interest from New Zealand responded so well to the care and attention he gave them. Tresco affords a fine example of Mr. Dorrien-Smith's skill in cultivating what was not very long ago a bleak, barren and wind-swept island for, in addition to the rare plants grown in his garden, he was the pioneer of the culture of Narcissi on an extensive scale for the supply of early flowers for the English markets. This work was originally undertaken for the purpose of fostering a new industry for the farmers in the Scilly Islands, who, about 35 years ago, were in financial distress owing to the serious competition that had arisen in the early potato market. An account of the Narcissus industry of the Scilly Islands was given in *Kew Bulletin*, 1913, p. 171.

South African Fever Bark.—In a letter to Kew, dated 23rd January, 1918, Mr. I. B. Pole-Evans, Chief of the Division of Botany, Department of Agriculture, Pretoria, has called attention to certain passages in an address to the Cape Town Medical Society on 25th August, 1899, by Dr. J. Maberly, concerning a South African fever bark. While in charge of the Letaba Gold Fields Hospital in the Central Transvaal, where bilious fever is prevalent, Dr. Maberly obtained seeds of the tree which yields this bark, and some of the bark itself, from a traveller who had been afforded practical experience of their efficacy in the low-veld between the Gold Fields and Delagoa Bay, where the tree occurs naturally.

Dr. Maberly's experience with the material proving similar to that of the traveller who had supplied this remedy, he was led to sow some of the seeds with the object of ascertaining the identity of the tree. Unfortunately his plants perished through accident ere this could be done, and although he subsequently secured further seeds, none of those of his second consignment germinated.

In 1917 Dr. Maberly became once more interested in the subject, but the material—a portion of the bark originally obtained by him—sent to Mr. Pole-Evans for identification, proved quite inadequate for the purpose. Dr. Maberly paid a

visit in person to the low-veld with the object of discovering the tree, but failed to do so.

Mr. Pole-Evans himself instituted a search for the source of this remedy, and very soon succeeded in finding the tree, and in ascertaining that the curative properties of its bark in fever cases are well known to the inhabitants of the low-veld.

The material obtained by Mr. Pole-Evans enabled him to recognise the plant as a species of *Croton*, and from that material and a photograph of the tree sent by him to Kew for specific determination, it was possible to recognise it as *C. Gubouga*, S. Moore. This species is widely spread in Nyasaland, Rhodesia, and tropical Portuguese East Africa, but has not previously been recorded from the Transvaal. The locality in which it has been found by Mr. Pole-Evans is on the Olifants River in the Lydenburg district. From a subsequent letter, dated 13th March, 1918, we learn that Mr. Pole-Evans has taken energetic steps for the proper therapeutic investigation of this remedy and the results of his action will be looked forward to with interest.

Rumphius's Herbarium Amboinense.*—The plan of exploring the island of Amboina with the special object of the interpretation and collection of the Rumphian species has been attempted by two botanists, both of whom have met with untimely deaths before their labours were completed. In 1900 Dr. J. G. Boerlage, of Buitenzorg, accompanied by Dr. J. J. Smith, made an excursion to Amboina for the purpose of collecting in their classical localities the plants described by Rumphius. Whilst returning to Java, Dr. Boerlage died of fever, and the results of his field work have unfortunately never been published. On behalf of the Bureau of Science, Manila, Dr. C. B. Robinson took up the same task on July 15th, 1913, and less than five months later he was killed by the natives about 15 kilometres from the town of Amboina (cf. *Kew Bull.* 1914, 192). Dr. Robinson was to have spent at least a year in Amboina and the neighbouring islands, and would no doubt have accomplished a great deal in the identification of the Rumphian species. This is evident from the publication before us, a volume of 595 pages, by Professor E. D. Merrill, at whose suggestion Dr. Robinson undertook the task. Professor Merrill has endeavoured to complete the work from the material available in order that the labours of his late colleague should not have been in vain.

Apart from its great historic interest, the special importance of Rumphius's work to taxonomists is that many of the plants described therein stand alone as the actual "types" of later authors. Of these there are no less than 350. As Professor Merrill says (p. 13): "In botanical literature there are scores of species whose only published descriptions are the brief general statements compiled from the Herbarium Amboinense, from which data alone it is usually impossible for the working systematist to gain any definite idea of the true character of the species";

* E. D. Merrill, An Interpretation of Rumphius's Herbarium Amboinense; pp. 595 and 2 maps; Bureau of Science, Manila, 1917.

and that "botanists generally have been content to work on the Malayan flora, describing as new the various forms that have appeared in current collections, without making any serious attempt to determine the exact status of species in the same groups based on Rumphian descriptions. Stability in nomenclature demands that the status of these early species be determined as soon as possible, for otherwise many reductions must be eventually made."

In the "Herbarium Amboinense" Rumphius named and described approximately 1,700 plants, the number of printed pages being over 1660 in seven volumes, with about 695 plates. According to Merrill the number of species represented is about 1200. The difficulties attending the identification of these plants, in the absence of any dried material, are obvious—especially so when we consider that the descriptions are non-technical, and that owing to an attack of blindness, Rumphius never even saw some of the figures, which were frequently prepared from other than the actual specimens described. This explains why sometimes the figure does not agree with the description, and why more than one species may be mixed on a single plate.

According to Professor Merrill, there are scores of cases in Loureiro's Flora Cochinchinensis (1790), for example, in which plants from that region are erroneously referred to binomials based alone on Rumphius's work. The same is the case with Burman f., Flora Indica (1768), where the plants described were from Java or some other part of Malaya, whilst the Rumphian references cited mostly prove to represent entirely different species. Professor Merrill has succeeded in referring definitely to binomials about 930 of the 1200 species described by Rumphius, and about 140 additional ones to their respective genera, leaving about 130 not placed under existing binomials. Future monographers should not overlook these puzzles when dealing with Malayan plants.

Professor Merrill, in his nomenclature, follows closely the International rules and recommendations. With regard to this he says (p. 44): "Stability in nomenclature can come only by adhering to definite rules and by critically working out the proper name for each species in conformity with those rules." Hence we find that the author has not hesitated even in changing the well-known names of the soy-bean, the cow-pea, and the pomelo, besides various familiar leguminous and mangrove trees.

The families and genera are arranged after Engler's system, the Rumphian names being cited as synonyms under the binomials to which the author considers they belong. Appended to the systematic arrangement is a list of the Rumphian names arranged in the sequence of the Herbarium Amboinense, giving references to the volume, the page, and the figures under each, and, so far as possible, their binomial equivalents. No doubt some of the determinations may be modified as the result of further research. For instance, *Balanostreblus ilicifolia*, Kurz (sensu stricto), should now be removed from the synonymy of *Taxotrophis ilicifolia*, Vidal (see *Kew Bull.* 1918, pp. 147-153), and *Cordia Myxa* will become *Cordia obliqua*, Willd. (*Kew Bull.* 1918, p. 221). At the

end of the volume is a comprehensive index; two maps, one showing the position of Amboina in the Malay Archipelago and the other the island itself on a large scale, are added. J. H.

Fungi and Disease in Plants.—Mycologists in all parts of the world will welcome the appearance of Dr. E. J. Butler's book on fungus diseases of plants. Dr. Butler was appointed Imperial Mycologist to the Government of India in 1901, and 17 years of hard work, which has included extensive travel over a vast territory, as well as much painstaking research, have given him a position that is unique amongst pathologists. The sub-title of the work indicates that it concerns the diseases of field and plantation crops in India and the East, but in a country such as India the number of crops to be included is obviously large and varied, and ranges from the beans and potatoes of the hills to rubber and sugar cane, a circumstance which gives the book an unusually wide purview.

The volume is divided into (1) a general part of 150 pages, and (2) a special part devoted to diseases of particular crops (365 pages). The first part, though commencing with the rudimentary principles of mycology and plant pathology, goes on to sections on such subjects as immunity, deterioration and control methods. The special part commences with a chapter (92 pages) on diseases of cereals (including rice, sorghum, etc.), and is undoubtedly the most complete summary of this subject in existence. A chapter on pulse crops follows, and the next one on vegetables, roots, and oil seeds, in both of which even the purely European mycologist will find much valuable reading. The remaining portion deals largely with diseases of tropical plants, and includes chapters on dye, drug, and spice crops, fibre crops, sugar cane, tea, coffee, and rubber.

The general account of the diseases and of the particular symptoms is very full, whilst a technical description of the parasitic organism, though also given in considerable detail, is added in small type to save space. Illustrations are numerous and good, there being over 200 figures, a large number of which are new, and several coloured plates. The volume concludes with a bibliography arranged under host plants. It will be noted that diseases of fruit and forest trees are not included, these being reserved for a second volume. Dr. Butler is to be congratulated on the completion of a very careful and laborious piece of work, and the production of a volume which will be invaluable to all pathologists and indispensable to those concerned with tropical crops. A. D. C.

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* Fungi and Disease in Plants. An introduction to the Diseases of Field and Plantation Crops, especially those of India and the East. By E J. Butler, M.B., F.L.S., Imperial Mycologist, Agricultural Research Institute, Pusa. Thacker, Spink and Co., Calcutta and Simla, 1918, pp. 547, figs. 206.

The Flora of Bermuda.*—In a handy volume of 585 pages, Dr. Britton has given a comprehensive account of the flora of Bermuda, or the Bermudas, which form an isolated group of six larger islands, and about sixty smaller ones, or cays, as well as many rocks or ledges, situated about 568 nautical miles east of Cape Hatteras, and consist of limestone, with many caves, resting on volcanic rocks. The islands, whose total land area is a little over 19 square miles, are scattered over an oblong about 15 miles long by 3 miles wide; they are hilly, their highest point rising to 250 feet above sea-level, and furnish no evidence of ever having been connected with other regions by land. The climate is sub-tropical and warm temperate. About 8·7 per cent. of the total native flora of 709 species (including Cryptogamia) is regarded as endemic. The number of flowering plants enumerated is 146, an increase of 26 on the number in Dr. W. Botting Hemsley's "Botany of the Challenger Expedition, 1885." while the ferns and their allies have diminished from 24 to 19 species. Mosses and hepaticae are represented by 51 species, lichens by 238, and fungi (still incompletely known) by 175. In addition to these 709 species, there are 303 others, which have been introduced through human activities, and have become completely or partially naturalised, and 864 species are recorded as having been cultivated in Bermuda. All the genera are illustrated by text-figures, including analyses. Introduced species are noted at the end of the genera to which they belong, while introduced genera are mentioned under their respective families. A bibliography, list of the principal botanical collections made in Bermuda, a glossary of botanical terms, and an index, complete a very useful volume, moulded on the same general plan as Britton and Brown's "Illustrated Flora of the Northern United States." J. H.

Visit of the Royal English Arboricultural Society.—On Thursday, September 12th, 55 members of the Royal English Arboricultural Society visited the gardens for the purpose of inspecting trees which are likely to be of use for sylvicultural purposes in the British Isles, and to examine the exhibits in the Museum of British Forestry. The party entered at the Lion Gate and after being shown a number of rare trees near the Pagoda proceeded to the Larch collection, where they were specially interested in *Larix occidentalis*. After seeing the collection trees they visited the plantation of this species formed in the Queen's Cottage Grounds from seeds sown in 1909. Some time was also spent in examining the plantation of seedling Elms in the same grounds. Attention was then paid to various Pines, Spruces and Alders. The members were greatly interested in the new flagstaff of Douglas Fir and afterwards spent some time in examining various Ashes, Poplars and Birches. Hybrid Poplars claimed a good deal of attention and many favourable comments were made respecting their prospective value for the

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* Flora of Bermuda, by Nathaniel Lord Britton, Ph.D., Sc.D., LL.D. New York, 1918.

production of timber. The Museum of British Forestry and the Museum devoted mainly to Colonial timbers also created a good deal of interest.

Sphagnum for Surgical Work.—In "The Bryologist" xxi. pp. 53-56 (July, 1918), Mr. G. E. Nichols has given an account of the use of Sphagnum for surgical dressings in the United States, where it was officially adopted by the American Red Cross in March, 1918. Previously its use had been restricted to:—(1), the formation of peat; (2), packing by florists and nurserymen; and (3), stable litter. A Sphagnum pad has been found to possess the following advantages over a cotton one:—(1), it will absorb liquids three times as fast; (2), it will absorb 16-22 times its weight of water as against 5-6 times by cotton; (3), greater retentive power, hence the dressings need changing less frequently; (4), absorbed liquids are more uniformly distributed throughout its mass; (5), it is cooler and less irritating; (6), it can be produced at much less expense.

In North America the species belonging to the *Inophloea* group (such as *S. papillosum*, *S. palustre*, *S. imbricatum* and *S. magellanicum*) have been found satisfactory; those with wiry stems are unsuitable. The suitability of a species is affected by its habitat; thus in Western Washington and Vancouver the order of suitability is:—(1), *S. imbricatum*; (2), *S. palustre*; (3), *S. papillosum*; while in the eastern States this order is exactly reversed. Even the same species will vary in the same bog; those specimens from its wettest, most open part being superior to those from parts more shaded or more densely inhabited by heaths, other bushy growths, grasses or sedges. The best Sphagnum-producing regions in the eastern States have been found in eastern Maine and Cape Breton Island, but good material has also been obtained from Michigan.

S. papillosum, Lindb., is the only one of the above-mentioned species which inhabits the British Isles, and is allied to *S. cymbifolium*, Ehrh. (the species most frequently used in Britain), from which it can be distinguished by its ochraceous colour and by its chlorophyllose cells, having the walls adjacent to the hyaline cells papillose, instead of smooth. In Britain it occurs in boggy situations throughout the country, as can be seen from the "Census Catalogue of British Mosses," p. 61 (1907). C. H. W.
